DOCUMENT RESUME

ED 380 128 IR 055 431

AUTHOR Dowler, Earl R.; And Others
TITLE The HOTT Program. Higher Order Techno Thinking: Its Trials and Tribulations.
PUB DATE [95]
NOTE 20p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; Computer Assisted Instruction; *Computer Mediated Communication; Computer Networks; Cultural Awareness; Educational Technology; Electronic Mail; Elementary School Students; Elementary Secondary Education; Graduate Students; Higher Education; Home Schooling; Independent Study; *Instructional Development; Junior High School Students; *Multicultural Education; Nontraditional Education; Role Playing; *Student Attitudes; Technological Advancement; Telecommunications
IDENTIFIERS *Higher Order Techno Thinking Program; University of New Mexico

ABSTRACT

The Higher Order Techno Thinking (HOTT) Program was developed by a group of graduate students, who were experienced teachers, at the University of New Mexico. The objective was to develop an environment in which independent research, curriculum integration, multicultural awareness, and technology application could be integrated into a general or alternative learning environment. About 30 elementary and middle school students from varied educational settings, including one that combines home and classroom schooling, participated in the HOTT program. Each received instruction in using telecommunications technology. Each student then assumed the role of an individual from another culture, accessing information about the chosen character through information provided by " Mr. Data," a graduate student. Mr. Data answered questions individually and communicated with the students in ways that increased their enthusiasm and interest. The information allowed students to role-play and interact electronically. Student reactions were positive and teachers agreed that the program had promoted its objectives and allowed students to experience the power of high technology communication. HOTT taught that the computer is a tool and not merely a toy. (SLD)

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The HOTT Program

Higher Order Techno Thinking
Its Trials and Tribulations

Authored by:

Earl R. Dowler

Contributing Authors:
Lee Allen
Dianne Hendricks
Bayyinah Muhammad
Karin Nord

University of New Mexico

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About the Author

Mr. Dowler received his undergraduate degree in history from the University of New Mexico. His honors include:

- Graduated **Cum Laude** and with Distinction
- **Phi Kappa Phi** Honor Society
- **Phi Alpha Theta** Honor Society
- Golden Key National Honor Society
- Blue Key National Honor Fraternity

He recieved his Master in Education with an emphasis in Technology Integration from the University of New Mexico. He was a presenter at the Third Interantional Tel-Ed Conference. He presently teaches computers at Lyndon Baines Johnson Middle School in Albuquerque, New Mexico.

Mr. Dowler spent the first 20 years of his professional life working in the private sector. He was Regional Manager for Sun Oil Company and has served on the Board of Directors of Financial Institution. He has an extensive business and training background.

Table of Contents

INTRODUCTION 1

ORIGINAL GOALS AND OBJECTIVES OF HOTT GROUP 1

INDIVIDUALS DESCRIPTION OF PROJECT 2

Bayyinah Muhammad (Home Schooling) 2
Where in The World Are You ? 2
Individual Outcomes 4

Dianne Hendricks 6
Thoughts On HOTT Project 6

Karin Nord 9
An Assistant's Reflections 9

Lee Allen, Librarian, Capshaw Middle School 10
Some excerpts from Capshaw students' response to the HOTTS Project: 11
Grant Obtained 11
Proposed project HOTT Line 11

Earl R. Dowler (Mr. Data) 12
Hardware and Software Used 12
Goals and Objectives 12
On Line Assignments 15

CONCLUSION 15

INTRODUCTION

For years, American business has known that the finest measurement of a program or product is the reactions and comments of the customer. In education, the customer is the student. The product is the dissemination of information, knowledge and problem solving skills. As educators, the way we package and present that product makes a difference. The following program is an example of enhanced and creative packaging that made a difference. A highly motivated group of professionals created a HOTT product , packaged it in "high tech", and delivered it to the students. Was it a success? Based on the reactions and comments of our students/customers, we think it was.

ORIGINAL GOALS AND OBJECTIVES OF HOTT GROUP

The ITS HOTT program was conceived by a collaborative group of graduate students/experienced teachers at the University of New Mexico. The educational goals and objectives of the group was to develop an environment whereby independent research, curriculum integration, multi cultural awareness and technology application could be integrated into a general or alternative learning environment. HOTT is an acronym for Higher Order Techno-Thinking.

The following goals and objectives were set:

1. Research
The program was designed to enable students to conduct independent research by themselves and collaboratively with peers, in all areas of the curriculum.

2. Interdisciplinary/Cross-curricular learning
The educational experience will be non-curricular specific.

3. Multi-cultural awareness
Students will develop perspectives on culture and ethnicitys other than those they are already familiar with.

4. Technology application
The students will demonstrate the ability to use telecommunications as the vehicle to achieve objectives 1, 2, and 3.

SUMMARY/ONGOING ACTIVITIES

Approximately 30 students from varied educational setting will participate in the HOTT PROGRAM. The students will receive instructions in telecommunications. After this instruction, students will meet with their facilitator to assume the role of an individual from another culture/era. Students at three locations will utilize the telecommunication skills to access information on their chosen character using a database known to them as

"Mr. Data" (E. Dowler). This information will enable students to role-play their chosen character. Students and the other locations, also role-playing, will interact with one another via "e"-mail and real time phone links. By the end of the six week project students will have asked questions, and received answers leading them to the identities of the other participants.

Three members of the HOTT team will facilitate the participants at their respective educational locations. Two others will assist with instruction and application of the technology. The final person serves as Mr. Data, Whom the participants will access for informational resources.

CULMINATION/EVALUATION

All participants will meet in Santa Fe at a specified location for a party, dressed as their assumed role. The students will assist in the program evaluation through comments, questionnaires and a final news letter.

INDIVIDUALS DESCRIPTION OF PROJECT

Bayyinah Muhammad (Home Schooling)

Where in The World Are You ?

I am blessed to be running a very unique classroom. La Escuela Familia is an effort to combine home schooling with public schooling in Santa Fe, New Mexico. I am a classroom teacher to 18 students, 3 my own, in a multi-level environment grades one through six.
We occupy a large double wide portable on school property and I am a half-time public school employee. Parents of the children involved are responsible for home schooling the two days a week the class does not meet. Parent in the classroom are also useful. What we've been able to establish in two years is a loving, family feeling, a place where innovative ideas are not only welcomed but are the basis for our choosing an alternative environment.

Although, there are many other reasons for families to choose this alternative, the general consensus is that we teach our children to effectively function as responsible, loving human beings in this world. We're about consciousness raising hopefully to develop beings who will want to share, respect and cooperate with others that they meet. The multi-cultural telecommunications project the five of us developed was a successful means to that end. Not only would it bring technological skills to the classroom but it would allow the culture bridging I think we desperately need to begin at early ages.

I introduced the concept at morning circle. Children were casually strewn on the carpet or propped up on pillows. I told the kids they would each be learning about a culture of their choice in the past or present. I explained that they would become anyone from that culture and that they would talk to other kids on the computer as that person. They could choose code names or use their initials as their secret on-line identities. Through questions and answers during phone line conferences they were to guess the identities of students at another school and in turn be guessed themselves. We also planned a party for the kids to meet in costume after the guessing game, Where in the World are You?

They were "psyched"! The older kids quickly bought into it and began shouting their choices, " I'm a ninja ", I'll be an African warrior, Shaka Zulu!!!". More clarification was needed if they were to become any warrior, peasant or queen,and not a SPECIFIC person in history.

I spoke to each child individually to nail down their choices. We then discussed as a group what things they'd need to know to actually live this person's life. The group came up with four basic areas of concern: What I would wear? What would I eat ? What would be a typical day in my life ? and Where would I live ? That would cover climate, terrain, dwellings etc. I excited the children by telling them that these questions would be asked and answered over the computer by the mysterious "person", Mr. Data. Mr. Data is one of the graduate students who put this program together and agreed to email the students personalized answers to their research questions. This process for my class would be slow and complicated. Two other graduate school students would have to transport kids to my home since as no phone line in the portable was available.

Once I had mustered up all the excitement for the project, I couldn't let it cool while the techno end of it moved slowly with only three or four kids going on line per day. So, I used the project to teach or reinforce other skills across the curriculum. First through third graders wrote letters to their parents explaining the project and asking for extra support at home. Ahh, the joys of home schooling! Fourth through sixth graders busily thumbed through encyclopedias to learn more about themselves. Several planned to meet on the off days at the public library to find other resources and to work on the reports they had decided to do on their countries. That brought in a lesson on outlining and organizing a paper.

Another day we decided to make maps of our countries. Five kids made dough to stick on the cardboard they'd sketched their countries on. Others decided modeling clay would look better. With atlases and maps at their sides and several parents in the room, they built the physical features of their countries on top the cardboard outlines. Children with flour models painted in rivers and labeled important cities. Clay models used several colors and developed map keys to decipher it all.

Meanwhile, on the techno end kids were going to the house learning the ins and outs of getting on line. They knew the access phone number, the names of the computers involved and would report this information to the others at morning meetings. They also used

computer time in the classroom to familiarize themselves with the keyboard so that typing could be facilitated. All of them were excited and curious about Mr. Data.

With research nearly completed and conferencing dates approaching I did one more activity to see if the kids were really solid on their characters. I had each child write a letter in their chosen persona and draw a picture of themselves in their environment. They included what they'd eaten that day, chores they'd done and one of the illustrations even had accurate vegetation of the country included in the background. We decorated the bulletin board with the fabulous results. And yes, they were ready to play, *Where and Who In The World Are You* with the Capshaw Middle School students.

Individual Outcomes

The challenges for my class were overwhelming. We had planned six weeks for the project but the timing was off for me. My class spent the first week of the project performing in a National Dance Institute show, the second week we moved into our grand new portable, and the third week we spent coordinating the logistics of getting kids to and from my home since the phone wasn't on in the classroom yet. By the time my little ones and I got it together Mr. Data was on overload with the middle schoolers questions. Having to wait for their answers, only few kids getting to go to the house at a time and their inept typing skills once they did get on the computer, were real frustrations. Even still, the project was a definite winner.

The enthusiasm was high and learning became exciting! The stimulation bubbled across curriculum. When have you ever been able to turn on a class about the letter writing part of Language Arts ? The role playing element made a big difference.

As the children learned facts about their countries and imagined life there they wanted to share in circle. Talking and listening improved. All one little first grader could say about herself was, " I'm Chinese. I work in a rice field." She was thrilled with her self-portrait with slanted eyes. " Look, this is me. I'm a Chinese peasant girl". One very basic element of multiculturalism is to elicit empathy from children. I couldn't see this child ever making fun of almond shaped eyes now that she has experienced having them herself.

As the project moved along, the children had become curious about the mysterious Mr. Data who was answering their email questions. Where was he? Can he hear us in this room talking ? etc. The room where my home computer is setup we also use as a family mosque. Arabic calligraphy and a picture of my spiritual leader decorate it's walls. One child noticing the picture of Sheikh Nazim on the wall, donned in his holy Islamic robe, a cuffee on his head, his long white beard hanging reverently asked, " Hey, is that Mr. Data?" Well, the adults fell out laughing. That was a good one. That actually sparked our What does Mr. Data look like contest. Here are some entries. One girl came pretty close with her illustration minus the glasses.

Since I was usually at school instructing the other group of kids I rarely participated in the on-line exchange. The one day I did, I was impressed. My eight year old was quizzing an

eighth grader about his persona. After a few lines of talk, she dictated and I typed to speed things up. (Her suggestion) Perched on my lap over a little laptop she was reading the responses quickly enough. " What do you wear HFB ?", Sakina asked.
" Wool or heavy cotton clothing"
" Are you in a cold country?"
" NO"
" Then why the wool ?"
" It's what we have around to make clothes with."
"You must be shepherd in Europe somewhere, huh?"
" No"
"What body of water is near you?"
"The Mediterranean Sea"
"Then you must be from Europe?"
"No"
"Africa, then?"
"No"

One of the adults went to get an atlas for Sakina and I. When she zeroed in on the Middle Eastern countries, she had him.

" Are you a Muslim ?" she eagerly asked
" Yes"
" I am too, As Salaam Alaikum" (Which means Peace be Unto You)
" You're smart, Wa Alaikum Salaam, my brother!"
" I'm a girl!!!" Sakina typed back indignantly while snickering.
" Hey, when do I get to ask you ?"
" Now, go ahead"
" Well, I know you are a Muslim girl... what do you do all day?"
" I cook, clean my house, wash clothes in the river and watch my kids."
" Are you a Saudi Arabian wife?"
" No, a wife yes, not from there"
" What body of water are you near ? Is your climate hot ?"
" I'm off the coast of the Atlantic Ocean, real hot here."

We imagined HFB was looking for an atlas or was just thinking during the next pause of a few minutes.
" Are you from Morocco ?"
"No"
" Spanish Sahara?"
" No". I showed Sakina where he was following the map down West Africa's coastline.
" You're close, come down a little farther" she typed.
" Down??? You mean south, don't you?" (grade differences apparent)
" Whatever".....
" Are you from Senegal?"
"Yes."

The detective work was fun to watch. They were both determined not to get off line without unraveling the other's identity. I loved the map using on-line too. It turned out that HFB really is a Muslim child we know. That is why both knew the Islamic greeting in Arabic. It is also interesting that both of them chose to extend their knowledge of Islam to other countries, but both started with a culture they were already familiar with. So did others in the class.

Native American kids chose to research their own tribes at a different time period. Everett chose to sail the seas with Columbus, digging into his Spanish heritage. Most of the kids used the opportunity to learn more about themselves. Others concerned themselves with the person they most wished they could be; a daring ninja, courageous pioneer woman, a Zulu chief....

I still do not know what too make of the boy who insisted on being a dinosaur. He said I said he could pick anybody from any time and a that a dinosaur was a "body" from another time. There weren't any people then to choose he reminded me. He researched it well. We got so involved I decided to do the dino unit I've been avoiding for the next unit study. This boy never did get on line as a velociraptor raptor because of time.
.He said he didn't mind, " Dinosaurs can't talk anyway"...

Dianne Hendricks

Thoughts On HOTT Project

This was certainly an exciting, educational adventure for me! Our HOTT group met during class on September 18 at the University of New Mexico to plan our project. Conceptually, it looked so professional I liked all of a our group members and I knew we had a great project.

I was pleased to be working with an innovative first through sixth grade class of 18 students taught by Bayyinah Muhammad through the Santa Fe Public Schools. The students are home schooled Tuesdays and Fridays and meet for formal instruction on Mondays, Wednesdays and Thursdays. Karin Nord and I planned to go to the class and help the students access information from Mr. Data (Butch Dowler) at UNM in Albuquerque) and then get on-line with Lee Allen's students at Capshaw Middle School in Santa Fe for their "Who am I?" projects.

We couldn't wait to get started. But wait we did!

Bayyinah was informed that she would have a phone line in her classroom by October 1, but that did not happen We were anxious to have the students get on-line on schedule so Karin and I started driving the children back and forth from their classroom to Bayyinah's home. It was a ten minute drive each way but we felt it was important to keep ot our

schedule. and it would only be for the first couple of times. So, on Monday, October 4 Karin and I drove our first group of six children to Bayyinah's home. None of the students had participated in on-line teleconferencing before. We stretched the phone cord from Bayyinah's living room to the study where Karin set up her laptop Macintosh computer. We introduced the students to the basics and explained how they would do on-line searches with Mr. Data and then teleconference with Lee's students at Capshaw. They were all very interested and very well behaved. Knowing that they would be working with older students from another school motivated our students to work harder. The students had already chosen their characters, so we got started right away. Karin and I helped some of the younger children type in their questions. The students were so intrigued with Mr. Data and wondered who he was! There was a picture of a religious leader on a wall in the study. One boy looked at it and asked "Is that Mr. Data?" Before we knew it, our time was up, so Karin and I drove the students back to school. I felt that the first session had gone very well and I looked forward to seeing everyone again.

We continued driving back and forth until the completion of the project!

On Thursday, October 28 Karin and I were working with some students at Bayyinah's house. We were having a lively on-line conversation with Lee's students and stayed until the very last minute. I drove the children back to school and left Karin to clean up and lock up at Bayyinah's. When I arrived at the classroom, some children were practicing multiplication on the board. Bayyinah and I had a quick conference to plan the next day's telecommunications activities. At one point in our conversation, Bayyinah turned and hurriedly wrote Karin's phone number on the board. One boy read the number and gasped "Oh no!" He thought he was being assigned seven digit multiplication.

On Friday, October 29, Karin, Bayyinah and I decided to meet at Bayyionah's home to let more children get on-line. We met at Bayyinah's house at 9:30 and planned to spend the morning conferencing with Lee's students. Amanda had spent the night with Bayyinah's girls and Ry came over to see Bayyinah's son. Karin had even left her computer at Bayyinah's overnight so we were all set to go. However, over and over again we'd set up Karin's computer and then -- CRASH! We figured out that Bayyinah's answering service was causing the problem. People know that she teaches her children at home on Fridays so she gets a lot of calls on that day. Bayyinah called the phone company to see what could be done about it but they could do nothing that morning. Besides, she was to be a participant in an upcoming conference dealing with racial attitudes and she really needed to get those calls. Finally, Karin called her roommate and asked Annie if we could go over to their house for the afternoon. Annie makes jewelry in their home, so their phone is actually a business line. She was nice enough to let us come over for the afternoon. We packed lunch for the children and then drove over to Karin's house on West Alameda. What began as a somewhat frustrating morning (for the adults) turned out to be a very productive afternoon and well worth the effort. All of our students got on-line with Lee's students. Our oldest student, sixth grader Ry, had a great conversation with the Capshaw students. He types fairly well, thinks quickly and can use the Atlas. Ry was also able to get on-line with Mr. Data .

Bayyinah finally DID get a phone line in her classroom on November 18. We're all happy for her. It's too late for this semester's telecommunications project but will surely be helpful in the future.

The concept of Mr. Data was a big positive. Our local library here in Los Alamos, New Mexico has a computerized circulation/inventory system which I've used, but it's not FUN like Mr. Data. Having Butch Dowler at University of New Mexico in Albuquerque playing Mr. Data sparked the students' interest and enthusiasm. I know I speak for all of us in saying that we really appreciate the efforts that Butch put forth in creating Mr. Data for our students. Butch personalized his answers to our students and made our project come alive.

Our main challenges were logistics, limited access to telecommunications, typing skills and learning levels of students. Karin and I helped the younger students with their typing and given enough time, all the students could write nice biographies of their characters. Obviously, a first or second grader could not be expected to have the map reading skills of an older child, so we gave the students help in this area. We did not want Lee's class to be bored. Theoretically, telecommunications is age, gender and race nonspecific. However, vocabulary, typing skills and topic could give some hints to the receiver.

I felt good about participating in this collaborative learning effort. It was very satisfying for me to see the students learning together and encouraging and cueing one another when we were on-line with Lee's students. I could feel the excitement and I know they could, too. Learning was in the air!

In all, I spent 13 days with Bayyinah's students, including a morning in the classroom supervising more encyclopedia research and an afternoon asking the students to help us evaluate our learning we experience with the telecommunications
project. The students drew pictures of their characters and also made maps of where their characters live. They also shared their thoughts about and drew pictures of Mr. Data. I thoroughly enjoyed working and learning with the students and Bayyinah and Karin. We can now laugh about our predicaments and be glad that we found ways to work together to solve our problems. I must say that I had fun and that it was truly an adventure However, it is clear to me that, in the very near future, students whose schools/home do not have telecommunications technologies will be at a serious disadvantage educationally. The more we learned about how much information is available through these technologies, the more I realize how much we need these technologies in our schools

Karin Nord

An Assistant's Reflections

I remember Saturday, September 18 and all the excitement for our proposed project titled Higher Order Techno Thinking, which we quickly shortened to HOTT. Almost three months of experiences have come to pass that were associated with the HOTT project. Overall I feel it has been a great success.

My role was that of assistant to the facilitators, photographer, referee, art teacher, and Apple Powerbook owner. It was both a frustration and unexpected pleasure to adapt different roles in unpredictable situations. It was our greatest setback that provoked the most interesting consequences. The set-back was our inability to network for the first few weeks into our project. I was, in fact the last member of the group to get a computer. From the moment it arrived it became a primary means linking our proposed network. It proved the versatile use of the powerbook as a very valuable computing resource. The link it made was from the alternate home school to the public school. There was a little irony here as the home school was housed by the public school system. Well this exercise of performing tasks for the HOTT project, has left the two schools with lasting positive effects, mostly in the alternate setting. I am happiest to be a part of this and to have had the outside perspective versus any other role in the bureaucracy.

The collaborative space opened between members of the HOTT group improved relations and became a part of our lives. The students did share the ups and downs, when the line was open and when technical difficulties kept us apart. There were frustrations and disappointments that were noted.I had great hopes of efficiency and assistance to Mr. Data in answering questions. I selected a CD ROM with my powerbook, but this set up proved my greatest frustration. Several technical reasons stopped me from assisting and added to several hours of wasted time. Call waiting, tele-access defective communications in communications software and lack conferencing abilities in certain places(mainly the home school). Home school students computed at two different home settings, which did include a dining room table and, on one occasion, my kitchen. It was on that day, in my kitchen, that I vicariously taught my first art lesson. Having only one computer running and four children, I had to keep them focused on the creative/learning experience. As one to two children were at my kitchen table computing, I had the others drawing with my pastels on paper grocery bags. The drawings were as successful as the on-line experiences.

While taking photographs for the project I left the students, on two occasions, to sort out their on-line assignment. It was very encouraging to see that they assisted and collaborated as well as worked as individuals. It did happen that the older students assisted the younger students in the home school so there was the added learning experience of leadership for some.
I hope my photographs will help tell the story.

Lee Allen, Librarian, Capshaw Middle School

Areas in which students in the HOTT Project had to access information pertaining to both on-line questions regarding their own "assumed" identities, and the areas of questioning they would be asking of their mysterious counterparts at the other end of the on-line live phone conferencing:

1. Location:	Where in the World Are You *Country, Continent, Geography*
2. Time Period:	When in Time are You? *Era, Epoch, Etc.*
3. Position in Life	Who are You? *Peasant, nobility, famous, infamous, station in life, etc.*
4. Culture:	Overview of Your Total Way of Life *Lifestyle, outlook, beliefs, arts*
5. Religion:	Spiritual Beliefs and Traditions
6. Language:	Linguistic Demography
7. Food:	Nutritional Habits and Traditions
8. Clothing:	Apparel, Traditional and/or Utilitarian
9. Climate:	Regional Geographic Weather and Atmospheric Characteristics

Each student, aside from assuming an "on-line identity" to disguise actual age, gender, race, etc.(initials of first, middle, and last names were generally used), "became" the assumed cultural identity; i.e., one was an Arabic warrior during the Crusades, one was an Egyptian noblewoman during the time of the Pharaohs, another chose the identity of a "surf bum" during the Fifties in Hawaii. Each took on the identity of a person who might have lived in a specific locale during a real time period which interested them personally. To research this identity, the students used e-mail to access a data-base known as "Mr. Data" in Albuquerque, as well some experience accessing the library at the University of New Mexico, and the CD-ROM version of Grolier's Encyclopedia. In short, nearly all information accessed was done so using electronic media. (More about this aspect from Mr. Data)

Some excerpts from Capshaw students' response to the HOTTS Project:

From Hamid a.k.a. HFB alias the medieval Arabic warrior:
Likes - " I liked it a lot because it was not boring research, and "talking" with other kids made it more of a challenge."
Dislikes - "Some of the kids did not communicate very well."

Changes - "The thing that I would change is to go on the computer more."
Differences (w/standard research) - "It is not fun just looking in an encyclopedia and writing on a piece of paper."
Future - "I would love to keep working with other kids in this country, and out of this country would be really cool."

Grant Obtained
Proposed project HOTT Line
A. Higher Order Techno-Thinking (E-Mail & Real-time Phone Links)
B. On-line experience with Telecommunication Technology

STUDENTS SERVED: Seventh & Eighth Grade students at Capshaw and Public School Home School Program (under B.Muhammad); initial training with twelve student library aides who will, in turn, train other students at Capshaw on the use of telecommunication technology.

GOALS:
1. Acquaint and familiarize Middle School students with current electronic information-gathering technologies, i.e., access to databases accessible via electronic mail such as Internet, University of New Mexico, Los Alamos National Laboratory, etc.

2. Allow students from different schools and programs to interact via telecommunications to foster knowledge and understanding of each other, making note of differences and, especially, similarities between them.

PROJECT DESCRIPTION
THE HOTT. (Higher Order Techno-Thinking) LINE will consist of two HAYES telephone/ Apple Macintosh computer modems linked via LANL & UNM E-Mail addresses to other schools in the Santa Fe Public School district and, eventually, schools in the Albuquerque School district. The Apple Macs are already installed at the Capshaw Library. The initial contact between the schools will involve the students combining research accessed from a University of New Mexico data bank known to the students as "Mr. Data" with on-line questions/discussions among the locations, based on multi-cultural awareness.

REASONS FOR THE PROGRAM
The long term objective of the HOTT. LINE is to promote and develop understanding of differences and similarities among peers at various schooling locations throughout New Mexico. Too often inter school rivalries enhanced by a misguided interpretation of "school spirit" results in animosities and outright hostilities toward each other, with a barrier of misunderstanding at the core of the resultant confrontations. This program is thus geared towards opening (electronic) doorways leading to the break down of those barriers to encourage understanding not only between various educational environments but also between the student participants as individuals.

BUDGET: $106.48, which will cover the cost of two (2) HAYES 2400B External Modems @ $49.99 each and $6.50 shipping & handling from Damark Int'l. Inc. Minimum requested: \plain\ul\f14\fs18\cf0 $106.48

Earl R. Dowler (Mr. Data)

Hardware and Software Used

From my perspective the project was one of coordination, research and self education in telecommunication and software application. My equipment consisted of a Compaq 486/33, with a NEC ROM player. I was running a Zoom 14.4 baud fax/modem. with Procomm Plus for Windows software. The CD's used for on-line research were the Compton's Family Encyclopedia, Microsoft Encarta, The Greatest Books Collection and the World Fact Book. On-line research was used using Gopher and Lynx. In addition, I also used my private library at home in Albuquerque, NM as a research source.

Goals and Objectives

One of my primary goals was to tailor and personalize the communication between Mr. Data and the individual student. I felt that this was of fundamental importance if the project was to be *Special* for the student. The communication had to be personalized so the student could make a real human connection with the technology. I did not want the student to feel as if he/she were talking to a video game. The following example demonstrates the personalization of communication between Mr. Data and two students in Santa Fe New Mexico. The first student was in middle school. The second student was in 4th grade.

Response To Middle School Student

To: Car
From: Mr. Data

Car I am so glad that you are interested in the history of Egypt. The Sun God Ra is actually a misnomer. The real son god was Re also called Amon. People put the two name together and called him Ra. The Egyptians worshipped Re during the Middle Kingdom. That would have been 2050-1800 BC. This is also called the Rein of the Twelfth Dynasty and is considered to be Egypt's classical or golden age. Queen Sobeknofru reigned during the Twelfth Dynasty and probably lived in Thebes (also called upper Egypt)

Now here is a question that you are to research. Look up the meaning of the following words and describe to your teacher what they mean.

1. Monotheism
2. Polytheism

You are doing an outstanding job on this assignment. Telecommunications and on-line research is very important. Keep up the great work. Thank you for the question.
Mr. Data

Response To 4th Grade Student
To: ANH
From: Mr. Data

ANH.... Welcome to Mr. Data's magic techno-world. I am so glad that you are one of my techno-friends. It is sooo neat to be in fourth grade...and fun too. I think that you are one of the neatest students that I have met. Every time you get in front of the computer I can see you and I think some of your school work is wonderful. I want you to promise that you will work hard in school and be sure to treat everyone nice. Now here is the answer to your question:

1. If you were a Pioneer women traveling across the United States in the 1800's you would have to be very strong and dedicated. Most of the women wore high laced shoes that fit very tight. They were not comfortable to walk in. They never wore slacks or shorts. That was not proper back then. They wore a long full dress with a blouse and a bonnet. You would have traveled in a covered wagon that was pulled by oxen or horses. There were no roads. If you were lucky you could go 15 miles a day. That means it would take you 4 days to go from Santa Fe to Albuquerque. Today it only takes 1 hour to drive from Santa Fe to Albuquerque.

Water would be very scarce. You would only take a bath when you were lucky enough to find a river or stream. You would get up at 4:30 in the morning, fix breakfast over an open fire, feed and water the horses and livestock, pack the wagons, hitch the teams to the wagons....after all that was done you would start to travel. It was a very difficult life.

Now I have an assignment for you. Find a picture of a pioneer women and child. What do you think the kids had to do during the day? How do you think they learned to read?
Thank you for the question.
Mr. Data

The second goal was to give answers using age appropriate terminology. There was a broad range of students that would be taking part in the HOTT project. Mr. Data spoke with students from second through eighth grade. In order to eliminate confusion I sent the following instructions to the participating teachers.

Procedure for submitting inquiries to Mr. Data

To assure that I can best answer questions that are given to me by students (and personalize them) would you please have students submit
their questions in the following format.

1. Their name.
2. Their grade level.
3. Their location.
4. Please have students write in full sentences and explain to me what they want to know and why it is important to know it.

My final goal and objective was to coordinate, educate and communicate effectively with the other members of the group. Early in the program it became apparent that this program was as much a learning tool for the adults as it was for the students. Our knowledge in telecommunication and on-line research was finite. The availability of adequate technology was, for some individuals, limited. Unlike the corporate world, where I had spent most of my working life, the HOTT group had very few resources. The lack of resources was offset by the creativity, tenacity and relentless dedication on the part of professional teachers *I know of no other group of professionals that work so hard, with so little and accomplish so much.* If American businesses had to operate under the same financial limitations and conditions imposed on the educational community the United States would be a Third World Economy.

Learning the power of on line research became a glaring problem. How does one access the amorphous information highway and dig out necessary information? I found the solution to the problem buried in the problem itself. Mr. Richard J. Smith of the Carnage Library of Pittsburgh and Mr. Jim Gerland Manager, Network Users Support Services at the State University of New York at Buffalo, were giving a world wide, on line telecommunication course called *Navigating The Internet.* The course took in over seventeen thousand subscribers in fifty four countries. I sat in the comfort of my home and in 30 days received 25 on line lessons. Using the University of New Mexico's VAX I down loaded the information and sent it to our HOTT group members through out the state. They in turn saved it to disk and created hard copy for themselves and the students. To my knowledge this information was not available in any public or school library in the area.

The adults were not the only ones that received on line instructions. The following is an assignment given to the students. This type of on line exercise further strengthens the bond between student and the off sight instructor.

On Line Assignments

To: All participating kids in ITS HOTT
From: Mr. Data
Subject: Your Assignment
To all my techno-friends I send greetings. I have been talking with my big brother at the University of New Mexico. His name is Libros. He is really smart and can tell you where to find the answers to your questions. He has asked me to give each of you an assignment. Here is what you are to do.

1. Think of a question that you cannot find the answer to on your own.
2. Call Libros at the University of New Mexico.
3. Get the name of two books that may have the information in it that you need.
4. Give the names of the books to your teacher.

Here is how you talk to Libros at the University.
1. Before you put in your name and password you will get a CDCN> PROMPT. This is where you usually type in BOOTES.
2. At the CDCD> PROMPT type in the following C UNMINFO
3. Login: unminfo
4. Terminal type=VT100 Press return
5. Get Welcome Sign....Press Return
6. Enter 7 for Library Access
7. Enter 2 for General Library

YOU ARE IN LIBROS:
Select category for search...author, title, subject, word.
Follow instructions....
If you will learn to do this you will be able to do things that most college kids cannot do. It is not hard. You can find out where to go to get any question in the world answered.
PLEASE DO THIS TECHNO-FRIENDS IT IS IMPORTANT AND FUN!!!!

CONCLUSION

Did this program meet or exceed the goals and objectives as set out by our group? Those of us who participated in the Higher Order Techno-Thinking program believe that it did.
1. Research
The program was designed to enable students to conduct independent research by themselves and collaboratively with peers, in all areas of the curriculum.

Independent and moderated research was conducted by students ranging from second to eighth grade. Research was performed on line through accessing Libros, Mr. Data, other schools, and students.

2. Interdisciplinary/Cross-curricular learning
The educational experience will be non-curricular specific.

The program was cross-curricular in nature. The research model required that students learned not only the history, culture, economics and belief systems of their chosen persona but also they had to learn about weather, climate, agriculture, animal and plant life.

3. Multi-cultural awareness
Students will develop perspectives on culture and ethnicity's other than those they are already familiar with.

Every participant took on a different culture. The cultural mix of the students enhanced the experience for everyone.

4. Technology application
The students will demonstrate the ability to use telecommunications as the vehicle to achieve objectives 1, 2, and 3.

With great effort on the part of the teachers all the students in the program experienced the power of high technology telecommunication. They used E-Mail, accessed electronic data bases, spoke in real time and on line to Mr. Data. Experienced on line instruction and received classroom training in the use of a computer as a tool....not a game.

Was the program a success? Here is what the kids say.

" I liked it a lot because it was not boring research, and "talking" with other kids made it more of a challenge."......HFB Capshaw Middle School

Would you like to continue working on line with computer?
"Yes! Yes! YES!!! I was talking to PEOPLE!".....CAR Capshaw middle School

"I would like to talk to schools in Japan and China. This is interesting and fun unlike other research".....BIF Capshaw Middle School